PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-335501
(43)Date of publication of application : 05.12.2000

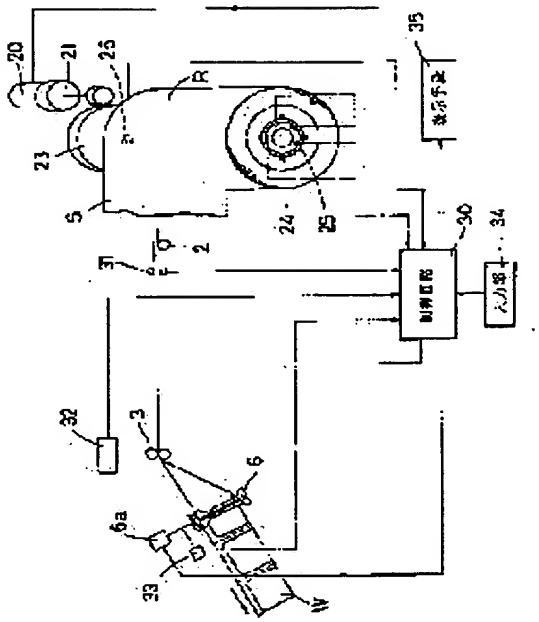
(51)Int.Cl. B65B 1/30
B65B 41/16

(21)Application number : 11-146284
(22)Date of filing : 26.05.1999

(71)Applicant : YUYAMA MANUFACTURING CO LTD
(72)Inventor : YUYAMA HIROYUKI

(54) DEVICE FOR SUBDIVISION PACK FOR MEDICINE

(57)Abstract:
PROBLEM TO BE SOLVED: To perform a smooth feeding of any one of papers such as laminated paper, glassine paper or the like having different quality without any rapid variation of tension in response to a reducing in diameter of a rolled paper when the paper is sent from the rolled paper at a paper feeding section to a subdivision pack section and to prevent occurrence of displacement of edges in paper during subdivision pack operation.
SOLUTION: A device for subdivision pack for medicine comprises a length measuring sensor composed of a rotary encoder 32 and an angle sensor having each of a plurality of hole element sensors 25 and magnets 24 of discriminating pieces combined to each other when a paper S is sent from a paper feeding section to a subdivision pack section to pack the medicine in portion. Four magnets 24 are corresponded to the laminated paper and eight magnets 24 are corresponded to a glassine paper, the number of sensing signals is made different in response to difference in paper quality, thereby the difference in paper quality can be discriminated. At a control section where the paper S is controlled in its feeding and braking operations with such sensing signals as above, its brake is controlled in stepwise manner by a control signal corresponding to a winding diameter of the paper, its tension is appropriately adjusted without rapid variation and adjustment of tension can be properly set in response to paper quality.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's

. decision of rejection]
[Date of extinction of right]

Partial translation of JP2000-335501 A

...omitted...

[0029] As shown in Figs. 4 and 6, magnets 24 and hole element sensors 25 as identifying members are provided along the inner circumference of the core tube P at one end of the support shaft 1 according to the embodiment. Four hole element sensors 25 are provided in four different positions shifted at intervals of 67.5° from one base point. As shown at (a), in the case of the core tube P made of cellopoly paper, the four magnets 24 are provided in four positions on a central line through the base point and another center line orthogonal to the center line, and as shown at (b), in the case of the core tube P made of glassine paper, four more magnets are provided at intervals of 45° in addition to the four positions on the orthogonal center lines described above, in other words, eight magnets 24 are provided in eight positions altogether.

[0030] In Fig. 6 at (a) and (b), the magnets 24 as the identifying members are arranged in different positions between the cellopoly paper and the glassine paper, so that they can be detected as different materials, and the above described arrangement is selected as the most rational combination of the numbers and positions of the magnets 24 and the hole element sensors 25 as the identifying members.

[0031] In the example shown at (a), as the core tube P rotates,

the magnets 24 rotate to match the sensor A (reference point) (angle $\theta = 0°$) at the hole element 25, and then reach the sensors B, C, and D as they rotate by 22.5°, 45°, and 67.5°, respectively. Then, the magnets 24 again rotate to reach the sensors A, B, ... In this way, as the magnets 24 rotate, the sensors A, B, C, and D are activated to detect the rotating angle.

[0032] Meanwhile, at (b), there are magnets 24 twice as many as those at (a) (eight). Therefore, two sensors A and C detect signals at a time, then when the tube rotates by 22.5°, the other two sensors B and D detect signals at a time, and then by another 22.5°, the two sensors A and C detect a signal rather than the detecting order of A, B, C, and D at (a). In other words, signals are similarly detected at intervals of 22.5° while the two sensors A and C and the two sensors B and D detect two signals at a time, which is different from the case shown at (a).

[0033] Other than the detection based on the rotating angle as described above, various modifications may be provided as shown at (i) and (ii) in Fig. 7. In the case shown at (i), eight hole elements 25 as sensors are provided equiangularly at intervals of 45°. For the cellopoly paper, two magnets 24 are provided at intervals of 22.5°, and for the glassine paper, two magnets 24 are provided at intervals of 45°. For the cellopoly paper, a signal is detected with every rotation by 22.5°, and for the glassine paper, a signal is detected with every rotation by 45°.

[0034] Note however that in the case of the cellopoly paper, the same sensors detect a signal twice. Meanwhile, for the glassine paper, two sensors detect signals at a time, and one of the signals is used. In the example, the detection angles are the different rotating angles, 22.5° and 45° for the cellopoly paper and the glassine paper.

[0035] The case at (ii) is the same as (i). Four hole elements 25 as sensors are provided at intervals of 90°. For the cellopoly paper, four magnets 24 are provided at intervals of 67.5°, and for the glassine paper, only one magnet 24 is provided. In this arrangement, the detection can be carried out at every 22.5° as the rotating angle for the cellopoly paper, while the detection is carried out at every 90° as the rotating angle for the glassine paper.

[0036] As describe above, detection may be carried out at a rotating angle of 22.5 both for cellopoly paper and glassine paper, and they may be distinguished based on whether the number of the sensor signals is one or two. Alternatively, they may be distinguished based on the difference in the rotating angle. In order to obtain the same detection precision for the rotating angle for these two different kinds of paper, the arrangement in Fig. 6 is advantageous. Now, the method of detecting in the arrangement in Fig. 6 will mainly be described.

[0037] In the above example, as the detector for detecting the rotation of the core tube P, the combination of the magnets 24

and hole elements 25 as identifying members is used. Alternatively, an optical sensor may be used. The optical sensor includes a light emitting element and a light receiving element, and they are fixed to one end of the supporting shaft 1 (outer shaft 1b) as with the hole elements 25.

[0038] Note however that they are provided at an extension of part of the flange end of the outer shaft 1b or an equivalent attachment base more on the outer end side than the hole element sensors 25 in Fig. 2, and projections are provided at a prescribed angular pitch of 22.5° on the side end of the core tube P so that the light emitting elements and the light receiving elements hold the projections between them. The numbers of the optical sensors and the projections are the same as the case of the hole element sensors 25. The optical sensor is a light shielding type sensor, but it may be a sensor that senses the indication of an identifying mark. In this case, the identifying mark may be provided on the core tube for example in the form of a barcode, so that the mark can be read by the optical sensor.

[0039] Fig. 3 is a schematic block diagram of a circuit that controls main elements of the device that feeds a packaging sheet from the paper feeding portion to the packaging portion and packages medicine. The control circuit 30 receives not only a signal representing the rotating angle and a signal from the shift detection sensor, but also a signal from an end sensor 31, a signal from a rotary encoder 32 provided at a feed roller

3 as a length measuring sensor, or a signal from a rotation number counter 33 that counts the number of rotation on the output shaft of a motor 6a coupled to the shaft of a heating roller 6. The reference numeral 34 represents an input portion to input data from the outside, and 35 represents display means for displaying the result of identifying the paper material of the sheet of a roll paper R based on a detection signal by the rotating angle sensor.

[0040] The control circuit 30 includes an identifying portion that identifies the kind of paper material of the sheet fed from the paper feeding portion, and a control portion that controls the brake according to the kind of sheet based on the identifying signal, the rotating angle signal, and the length measurement signal. The control portion also controls the rotation of the motor. The identifying portion includes data storing means and determining means. The data storing means stores combinations of positions and numbers of the identifying marks such as a barcode or identifying members such as magnets 24 and sensors in association with each other every time the kind of the paper material is identified based on the number of sensor signals or different detection angles about the rotating angle signals. The determining means determines the kind of sheet according to the detection signal based on the combination of the detected identifying mark or member and the sensors.

[0041] The signal obtained as a result of identifying the kind

of paper material of the sheet by the identifying portion is displayed at the display means 35. Note that the kind of paper material of the sheet may be indicated based on the identifying signal in the process of packaging operation, but the indication is preferably made before the start of packaging operation. The identifying signal is transmitted to the control portion together with the rotating angle signal. The control portion refers to the identifying signal and calculates the amount and diameter of the roll paper after the roll is fed from the paper feeding portion based on the rotating angle or change in the sheet feeding length relative to a prescribed length or a prescribed rotating angle obtained from the rotating angle signal and the length measurement signal as a reference, controls a motor brake 20 as the brake means to provide braking force suitable for the kind of paper material of the sheet or the change in the diameter of the roll based on the calculation result, and adjusts the sheet tension. The control portion also outputs a control instruction to the motor 6a.

[0042] Fig. 5 is a side view in the direction of V-V in Fig. 2 and mainly shows how the sensor for detecting the shift of the packaging sheet is provided. In this example, one proximity switch 26 is provided at a support plate 11, and 16 projections 27 are provided at the flange part 15 at the end of the rotating hollow shaft 1c of the support shaft 1. The shift detection sensor detects the presence/absence of the feeding shift of the

packaging sheet using the rotating angle sensor signal by the hole element sensors 25 as a reference based on whether a signal at the same pitch as that of the reference signal is not detected.

...omitted...